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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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AFFYMETRIX, INC
ATTN: CHIEF IP COUNSEL, LEGAL DEPT.
3380 CENTRAL EXPRESSWAY
SANTA CLARA, CA 95051

EXAMINER	
KIM, YOUNG J	
ART UNIT	**PAPER NUMBER**
1637	

DATE MAILED: 11/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/904,039	DONG ET AL.	
	Examiner	Art Unit	
	Young J. Kim	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *39-53,57,58 and 174-177* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *57,58 and 174-177* is/are allowed.

6)☒ Claim(s) *39-53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is responsive to the Amendment received on August 15, 2005.

Preliminary Remark

No claims were canceled or added in the instant Amendment.

Claims 39-53, 57, 58, and 174-177 are pending and are under prosecution therefore.

Claim Rejections - 35 USC § 112

The rejection of claims 39-53 under 35 U.S.C. 112, second paragraph as failing to comply with the enablement requirement, made in the Office Action mailed on May 13, 2005 is withdrawn in view of the arguments presented in the Amendment received on August 15, 2005.

New Grounds

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 39-53 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 39 is indefinite for the following reasons.

Claim 39 recite that a nucleic acid is provided, wherein a computer system is used to identify polymorphisms that are predicted to be present on fragments that are amplified when the first nucleic acid is fragmented by a selected fragmentation and amplified with an amplification method, but the array is recited as consisting essentially of probes to interrogate the genotype of a plurality of polymorphisms. Hence, there is a disconnect between the limitation involving a computer system and the probes that are on the array. Clarification is requested.

For the purpose of compact prosecution, claim 39 has been construed so that the limitation involving the computer system does not materially affect the composition of the probes of the array (*i.e.,* not given patentable weight; *see also* MPEP 2106(II)(C)).

Claims 40-53 are indefinite by way of their dependency on claim 39.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 39-45, 48, and 49-53 are rejected under 35 U.S.C. 102(a) and 102(e) as being anticipated by Sapolsky et al. (U.S. Patent No. 5,710,000, issued January 20, 1998, filed June 7, 1995).

Sapolsky et al. disclose a method of analyzing a first nucleic acid sample, said method comprising the steps:

a) providing a first nucleic acid sample (column 4, lines 6-8);

b) producing a second nucleic acid sample by fragmentation (column 4, lines 8-9), ligating adaptor sequences thereto (column 4, lines 10, 14, and 15), and amplifying the fragments ligated with said adaptor sequences (column 8, lines 47-50);

c) providing a nucleic acid array (column 11, lines 57-58);

d) hybridizing the amplified fragments to the array (column 11, lines 31-35; lines 57-58); and

e) analyzing a hybridization pattern from said hybridization (column 16, lines 47-51).

The method of Sapolsky et al. is employed for the detection of polymorphic nucleotides in the adaptor amplified fragments (column 15, lines 47-50), thereby anticipating claims 39, 52, and 53.

With regard to claims 40-43, as Sapolsky et al. employ the same method steps as claimed by claim 39, it is determined that the method would necessarily produce the required percentage of second fragments.

With regard to claims 44 and 45, Sapolsky et al. employ genomic DNA samples (column 13, line 36).

With regard to claims 48 and 49, Sapolsky et al. employ type IIs endonuclease (column 3, line 62; column 15, line 42-44).

With regard to claims 50 and 51, Sapolsky et al. disclose that the adaptors, in addition to containing type IIs endonuclease recognition site (broadly embraced by the term, "tag" sequence), contains primer sequences for amplification purposes (column 8, lines 47-50).

Therefore, Sapolsky et al. anticipate the invention as claimed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 46 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sapolsky et al. (U.S. Patent No. U.S. Patent No. 5,710,000, issued January 20, 1998, filed June 7, 1995) in view of Kato (EP 0 735 144 A1, published October 2, 1996)

Sapolsky et al. disclose a method of analyzing a first nucleic acid sample, said method comprising the steps:

a) providing a first nucleic acid sample (column 4, lines 6-8);

b) producing a second nucleic acid sample by fragmentation (column 4, lines 8-9), ligating adaptor sequences thereto (column 4, lines 10, 14, and 15), and amplifying the fragments ligated with said adaptor sequences (column 8, lines 47-50);

c) providing a nucleic acid array (column 11, lines 57-58);

d) hybridizing the amplified fragments to the array (column 11, lines 31-35; lines 57-58); and

e) analyzing a hybridization pattern from said hybridization (column 16, lines 47-51).

The method of Sapolsky et al. is employed for the detection of polymorphic nucleotides in the adaptor amplified fragments (column 15, lines 47-50).

Sapolsky et al. employ the same method steps as claimed by claim 39, it is determined that the method would necessarily produce the required percentage of second fragments.

Sapolsky et al. employ genomic DNA samples (column 13, line 36).

Sapolsky et al. employ type IIs endonuclease (column 3, line 62; column 15, line 42-44).

Sapolsky et al. disclose that the adaptors, in addition to containing type IIs endonuclease recognition site (broadly embraced by the term, "tag" sequence), contains primer sequences for amplification purposes (column 8, lines 47-50).

Sapolsky et al. do not explicitly disclose that the method is conducted on a cDNA derived from an RNA or mRNA (claim 46) or that the method of fragmentation, ligation, and amplification steps are conducted in a single reaction vessel (claim 47).

Kato discloses a method of molecular indexing, wherein the first nucleic acid is fragmented with a Type IIS endonuclease, followed by the ligation of an adaptor to the fragment ends (page 3, lines 1-4). Kato discloses that the first nucleic acid is a cDNA derived from RNA (page 3, at line 1).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Sapolsky et al. and Kato, thus arriving at a method for determining polymorphisms on a cDNAs derived from RNAs for the following reasons.

It is well known in the art that the occurrence of polymorphism occurs in both non-coding and coding regions. Hence, one of ordinary skill in the art would have known that the use of genomic DNA (non-limiting to coding region) or cDNA (limiting to coding regions) for detecting polymorphism would have been equally useful. Such is evidenced by the disclosure of Kato who states:

> "[T]he target analysis is not limited RNA (or cDNA reverse-transcribed therefrom)...it is also possible to amplify restriction fragments from cosmid DNA or genomic DNA...[i]n addition, regions amplified by PCR is not restricted to non-coding regions." (page 3, line 57 through page 4, line 4).

Hence, one of ordinary skill in the art at the time the invention was made would have been reasonably motivated to combine the teachings of Sapolsky et al. with the Kato for the purpose of screening cDNAs for polymorphisms. MPEP, at 2143.02, states that the prior art can be modified or combined to reject claims as obvious as long as there is a reasonable expectation of success. Given that one of ordinary skill in the art at the time the invention was made would have had a reasonable expectation of success combining the teachings as Kato clearly states that fragmentation

and ligation of adaptors thereto is clearly applicable to both cDNA and genomic DNA, invention as claimed is further obvious over the cited references.

With regard to claim 47, while none of the artisans are explicit in stating that a single reaction vessel is employed in producing the fragments, ligating, and amplifying steps, as all of the steps are clearly conducted by Sapolsky et al., one of ordinary skill in the art would clearly recognize that if artisans did not conduct all of the steps in a single reaction tube, whether to conduct the steps in a single reaction tube or not would clearly be within the purview of an ordinarily skilled artisan.

For the above reasons, the invention as claimed is *prima facie* obvious over the cited references.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., In re Berg, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); In re Goodman, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); In re Longi, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); In re Van Ornum, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); In re Vogel, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and In re Thorington, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 39-53 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 39 of copending Application No. 10/316,881 (herein the '881 application). Although the conflicting claims are not identical, they are not patentably distinct from each other for the following reasons.

Claim 39 is drawn to a method of analyzing a first nucleic acid sample comprising the steps:

a) providing a first nucleic acid sample;

b) generating a second nucleic acid sample by fragmentation, adaptor ligation, and amplification of the adaptor-ligated fragments; and

c) hybridizing the amplified fragments to an array of oligonucleotide probes; and

d) analyzing the hybridization pattern.

Claim 39 of the '881 application is drawn to a method of genotyping a plurality of SNPs comprising the steps:

a) fragmenting a nucleic acid sample (or first nucleic acid) with a type IIs restriction enzyme;

b) ligating adaptors to the fragments;

c) amplifying the adaptor-ligated fragments;

d) fragmenting the amplified fragments;

e) labeling the amplified fragments;

f) hybridizing the amplified fragments to a genotyping array; and

g) genotyping the genotype of at least one SNP.

Hence, claim 39 of the '881 application has all of the steps present in claim 39 of the instant application in a species-genus type relation.

With regard to claims 40-53, claim 39 of the '881 application employs type IIs endonuclease (see claim 39, page 66, line 44), amplification of the adaptor-ligated fragment via use of a common

primer that is complementary to the adaptor sequence (see claim 39, page 66, lines 1-2), the method drawn to genomic DNA (page 1, line 23), RNAs.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

Claims 57, 58, and 174-177 are free of prior art.

Inquiries

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Young J. Kim whose telephone number is (571) 272-0785. The Examiner is on flex-time schedule and can best be reached from 8:30 a.m. to 4:30 p.m. The Examiner can also be reached via e-mail to Young.Kim@uspto.gov. However, the office cannot guarantee security through the e-mail system nor should official papers be transmitted through this route.

If attempts to reach the Examiner by telephone are unsuccessful, the Primary Examiner in charge of the prosecution, Dr. Kenneth Horlick, can be reached at (571) 272-0784. If the attempts to reach the above Examiners are unsuccessful, the Examiner's supervisor, Dr. Gary Benzion, can be reached at (571) 272-0782.

Papers related to this application may be submitted to Art Unit 1637 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 CFR 1.6(d)). NOTE: If applicant does submit a paper by FAX, the original copy should be retained by applicant or applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED, so as to avoid the processing of duplicate papers in the Office. All official documents must be sent to the Official Tech Center Fax number: (571) 273-8300. For Unofficial documents, faxes can be sent directly to the Examiner at (571) 273-0785. Any inquiry of a general nature or relating to the

status of this application should be directed to the Group receptionist whose telephone number is (571) 272-1600.

Young J. Kim
Patent Examiner
Art Unit 1637
11/10/2005

YOUNG J. KIM
PATENT EXAMINER

yjk